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|  | INTERNATIONAL TELECOMMUNICATION UNION**TELECOMMUNICATIONSTANDARDIZATION SECTOR**STUDY PERIOD 2022-2024 | TSAG-TD335 |
| TSAG  |
| Original: English |
| **Question(s):** | N/A | Geneva, 22-26 January 2024 |
| **TD** |
| **Source:** | Chair, ITU-T Study Group 11 |
| **Title:** | ITU-T SG11 Lead Study Group Report |
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| **Abstract:** | This document contains the Report of the ITU-T SG11 on lead study group activities (June 2023 – January 2024). |

1. **Background**

According to Resolution 2 of WTSA-20, ITU-T Study Group 11 is the lead study group on:

* signalling and protocols;
* establishing test specifications, conformance and interoperability testing for all types of networks, technologies and services that are the subject of study and standardization by all ITU-T study groups;
* combating counterfeiting of ICT devices;
* combating the use of stolen ICT devices.
1. **General information**

SG11 conducted its third meeting in Geneva from 10 to 20 October 2023. During this meeting, SG11 consented 16 draft Recommendations, including Amendments to existing Recommendations, approved one supplement and one technical report, and started 14 new work items (see [SG11-TD606/GEN](https://www.itu.int/md/meetingdoc.asp?lang=en&parent=T22-SG11-231010-TD-GEN-0606) and [SG11-TD607-R1/GEN](https://www.itu.int/md/T22-SG11-231010-TD-GEN-0607/en)). More details are available in the [executive summary](https://www.itu.int/en/ITU-T/studygroups/2022-2024/11/Pages/exec-sum-202310.aspx) and SG11 reports posted as [SG11-R14](https://www.itu.int/md/meetingdoc.asp?lang=en&parent=T22-SG11-R-0014), [SG11-R15](https://www.itu.int/md/meetingdoc.asp?lang=en&parent=T22-SG11-R-0015), [SG11-R16](https://www.itu.int/md/meetingdoc.asp?lang=en&parent=T22-SG11-R-0016), [SG11-R17](https://www.itu.int/md/meetingdoc.asp?lang=en&parent=T22-SG11-R-0017), and [SG11-R18](https://www.itu.int/md/meetingdoc.asp?lang=en&parent=T22-SG11-R-0018).

Interim WP1/11, WP2/11, WP3/11 and WP4/11 meetings will be held fully virtual on 7 February 2024 and they will be preceded by interim RGMs e-meetings (29 January – 6 February 2024).

The next SG11 meeting is planned to be held in Geneva from 1 to 10 May 2024 (TBA).

1. **Report of ITU-T SG11 on lead study group activities (June 2023 – January 2024)**
	1. **Signalling and protocols**

In July 2023, the following draft new Recommendations were approved following AAP procedure:

* + ITU-T Q.4140 (ex.Q.CPN): Signalling requirements for service deployment in computing power network;
	+ ITU-T Q.5006 (ex.Q.hns): Signaling requirements for hierarchical network slicing service.

In October 2023, SG11 consented one Recommendation on Computing Power Network (CPN) — ITU-T Q.4141 (ex. Q.BNG-INC): Requirements and signalling of intelligence control for the border network gateway in computing power network, and started six signalling-related new work items. More details are available in the [SG11-TD607-R1/GEN](https://www.itu.int/md/meetingdoc.asp?lang=en&parent=T22-SG11-231010-TD-GEN-0607).

**IMT-2020 and managed P2P communications related issues**

With regard to IMT-2020 related aspects, in July 2023, the following draft new Recommendations were approved following AAP procedure:

* + ITU-T Q.5026 (ex Q.DIVS-IMT2020) “Signalling Requirements and Protocol for Providing Network-oriented Data Integrity Verification Service based on Blockchain in IMT-2020 network”;
	+ ITU-T Q.5027 (ex Q.IITSN) “Protocol for IMT-2020 network Integration with Time Sensitive Network”.

In October 2023, SG11 consented the following draft Recommendations:

* + ITU-T Q.5007 (ex. Q.IEC-PRO) “Signalling architecture for microservices based intelligent edge computing”;
	+ ITU-T Q.5008 (ex. Q.AIS-SRA) “Signalling requirements and architecture to support AI based vertical services in future network, IMT2020 and beyond”;
	+ ITU-T Q.5028 (ex. Q.IEC-SAINF) “Data management interfaces for intelligent edge computing-based smart agriculture service”.

Also, in October 2023, SG11 started two IMT-2020-related new work items and one P2P-related new work item. More details are available in [SG11-TD607-R1/GEN](https://www.itu.int/md/meetingdoc.asp?lang=en&parent=T22-SG11-231010-TD-GEN-0607).

**Security issues of SS7 and other protocols**

Since 2016, ITU-T SG11 has continued its studies on implementation of security measures on signalling level in order to cope with different types of attacks on existing ICT infrastructure and services (e.g. OTP intercept, calls intercept, spoofing numbers, robocalls, etc.).

Among the solutions to be implemented against such attacks is the use of digital signature (digital certificates) in the signalling exchange which may guarantee the trustworthiness of the sender.

In 2020 and further in 2022, ITU-T SG11 developed three key standards which define the way a digital certificate can be inserted into signalling exchange (ITU-T Q.3057, Q.3062 and Q.3063).

Following the AAP procedure, the Corrigendum 1 to ITU-T Q.3063 “Signalling procedures of calling line identification authentication” was approved in July 2023 accordingly.

In October 2023, ITU-T SG11 consented three amendments which define extensions in SS7 and BICC signalling to support the calling line identification authentication in line with the approach defined in ITU-T Q.3063. Among the consented Amendments are:

* Draft Amendment 7 to ITU-T Q.763: Signalling System No. 7 – ISDN User Part formats and codes. Amendment 7: Extensions for the support for the calling line identification authentication;
* Draft Amendment 2 to ITU-T Q.931: ISDN user-network interface layer 3 specification for basic call control. Amendment 2: Extensions for the support for the calling line identification authentication;
* Draft Amendment 6 to Q.1902.3: Bearer Independent Call Control protocol (Capability Set 2) and Signalling System No. 7 ISDN User Part: Formats and codes. Amendment 6: Extensions for the support for the calling line identification authentication.

Also, based on the received contributions, ITU-T SG11 advanced the ongoing work item Q.TSCA “Procedure for issuing digital certificates for signalling security”. It became a fourth part of the ITU-T SG11 standards related to signalling security (ITU-T Q.3057, ITU-T Q.3062 and ITU-T Q.3063).

Finally, ITU-T SG11 started a new work item Q.DMSA “Principles for detection and mitigation of signalling attacks in security signalling gateways”.

ITU-T SG11 continues close collaboration with ITU-T SG17 and ITU-T SG2 on this subject matter.

All ITU-T SG11 results and related events (workshops, webinars) on signalling security are available on dedicated web page at: <https://itu.int/go/SIG-SECURITY>.

**QKDN protocols**

ITU-T SG11 consented five new Recommendations that define requirements for QKDN protocols, as follows:

* ITU-T Q.4160 (ex. Q.QKDN\_profr): Quantum key distribution networks – Protocol framework;
* ITU-T Q.4161 (ex. Q.QKDN\_Ak): Protocols for Ak interface for quantum key distribution network;
* ITU-T Q.4162 (ex. Q.QKDN\_Kq-1): Protocols for Kq-1 interface for quantum key distribution network;
* ITU-T Q.4163 (ex. Q.QKDN\_Kx): Protocols for Kx interface for quantum key distribution network;
* ITU-T Q.4164 (ex. Q.QKDN\_Ck): Protocols for Ck interface for quantum key distribution network.

Following this result, ITU-T SG11 agreed to set up a new Q.subseries for new ITU-T Recommendations that deal with signalling aspects of QKDN: Q.4160-Q.4179: Protocols and signalling for Quantum key distribution networks.

Also, as a continuation of this study, ITU-T SG11 started a new work item Q.QKDNi\_KM “Protocols for interfaces between key managers for quantum key distribution network interworking”. More details are available in [SG11-TD607-R1/GEN](https://www.itu.int/md/meetingdoc.asp?lang=en&parent=T22-SG11-231010-TD-GEN-0607).

* 1. **Establishing test specifications, conformance and interoperability testing for all types of networks, technologies and services that are the subject of study and standardization by all ITU‑T study groups**

**ITU-T Recommendations on conformance and interoperability testing**

ITU-T SG11 consented new Recommendation ITU-T Q.4071 (ex. Q.UHD-T) “The testing of 3D ultra-high density IoT networks” and advanced one ongoing work item that deals with the testing of the robotics on the model network (Q.TSN).

ITU-T SG11 consented three new Recommendations related to testing and monitoring specifications, as follows:

* ITU-T Q.3962 (ex. Q.joint.tr): Requirements and Reference Model for optimized traceroute of joint Internet Protocol/Multi-Protocol Label Switching;
* ITU-T Q.4045 (ex. Q.N-att-framework): Framework of network function virtualization automated testing;
* ITU-T Q.4046 (ex. Q.BaaS-iop-reqts): Interoperability testing requirements of blockchain as a service.

ITU-T SG11 started two new work items on testing subjects. More details are available in [SG11-TD607-R1/GEN](https://www.itu.int/md/meetingdoc.asp?lang=en&parent=T22-SG11-231010-TD-GEN-0607).

**Conformity Assessment Steering Committee (CASC)**

The sixteenth meeting of the ITU-T Conformity Assessment Steering Committee (CASC) was held in Geneva on 12 October 2023 during the ITU-T SG11 meeting. TSB gave a comprehensive presentation about the current status of the ITU Testing Laboratories database ([TD609/GEN](https://www.itu.int/md/meetingdoc.asp?lang=en&parent=T22-SG11-231010-TD-GEN-0609)). It was highlighted that since May 2023, some TLs, which are listed in the database, provided updates regarding their scope of accreditation and its validity. The database was updated accordingly. Also, it was noted that ITU registered GPON ONT end-device (category: optical fiber equipment) in the Product Conformity Database (<https://itu.int/go/tcdb>). It was tested by Potin (Beijing) Technology Co., Ltd (laboratory ID CNAS L14624) registered in ITU TL Database.

Based on requests from ITU members, ITU organized a tutorial on Testing Laboratories recognition procedure which was organized back-to-back with the CASC meeting on 12 October 2023. The tutorial was aimed at guiding all stakeholders on the Testing Laboratories recognition procedure established by ITU, its benefits, and all logistical details needed for submitting applications.

CASC updated the list of ITU-T technical experts based on the received input from ITU-T SG5 and according to the criteria and procedure defined in cl.9.1 of [ITU-T Guideline](https://www.itu.int/en/ITU-T/studygroups/com11/casc/Documents/Guideline_CASC_EXP_RP-10-2019.pdf) “ITU-T CASC procedure to appoint ITU-T technical experts” (2019). The list of ITU-T Technical experts is updated accordingly and posted on the CASC webpage at: <https://itu.int/go/casc>.

All details are available in the CASC report (Annex 6 to the SG11 report, [SG11-R14](https://www.itu.int/md/T22-SG11-R-0014/en)).

* 1. **Combating counterfeiting and the use of stolen ICT devices**

Following the first Episode on the ITU webinars series on combating counterfeiting and stolen ICT devices started in 2023, ITU organized the second Episode “Global approaches on combating counterfeiting of telecommunication/ICT devices and mobile device theft” which took place in Geneva, on 13 October 2023 during the ITU-T SG11 meeting.

The meeting was attended by 114 participants (45 in person) from 45 countries. Among the panellists were representatives of WIPO, WTO, OECD, Anatel (Brazil), SC.Soft (Kazakhstan), Robi (Bangladesh), URSEC (Uruguay), Scancom PLC, MTN (Ghana), Technokratik Corporation (US), NCA (Ghana), C-DOT (India), GSMA, UCC (Uganda), ITU-T SG11 VC/WP4/11 Chair and vice-rapporteur of Q4/2 of ITU-D SG2.

Among key takeaways was a proposal to strengthen collaboration among ITU, WIPO, WTO, OECD and other international organizations on addressing these crucial matters. As a first step forward, ITU-T SG11 agreed to send liaison statements to these organizations in order to inform them about achieved outcomes and the particular work under study.

Also, ITU-T SG11 agreed one Supplement and one Technical report as follows:

* Q Suppl.76 (ex. Q.Sup.CEIR-EIR-int): Common approaches and interfaces for data exchange between CEIR and EIR;
* QSTR-MCM-UC (ex. TR-MCM-Use-Cases): Use Cases on the combat of Multimedia Content Misappropriation.

Following the updates made in the draft Supplement ITU-T Q.Supplement.75-Rev: Use cases on the combat of counterfeit ICT stolen mobile devices, ITU-T SG11 agreed to request TSB to issue a circular inviting ITU Members to provide relevant updates to the use cases on the combat of counterfeit and/or stolen ICT devices, including implementation of Central Equipment Identity Register (CEIR).

ITU-T SG11 started a new work item Q.GIR which will define the technical requirements and implementation strategy for the Global International Mobile Equipment Identity Registry. More details are available in [SG11-TD607-R1/GEN](https://www.itu.int/md/meetingdoc.asp?lang=en&parent=T22-SG11-231010-TD-GEN-0607).

1. **Preparation for WTSA-24**

ITU-T SG11 continues preparation to WTSA. In October 2023, ITU-T SG11 updated most of its current questions texts. Finally, as of October 2023, ITU-T SG11 achieved the following progress:

* Revised Questions’ texts for A/11 (1/11), B/11 (2/11), C/11 (3/11), D/11 (4/11), E/11 (5/11), F/11 (6/11), G/11 (7/11), H/11 (8/11); I/11 (12/11); J/11 (13/11), K/11 (14/11), L/11 (15/11) and N/11 (17/11);
*Note: The ToR of Questions M/11 (16/11) was not discussed at this particular meeting due to lack of proposals.*
* Updated SG11 title, mandate, points of guidance and lead SG roles (updates to Resolution 2 of WTSA-20).
*Note: there were no additional updates since May 2023.*

The updated Questions texts for the next study period as well as proposed changes for the ITU-T SG11 mandate and lead roles, are available in [SG11-TD612-R1/GEN](https://www.itu.int/md/T22-SG11-231010-TD-GEN-0612/en) and [SG11-TD263/GEN](https://www.itu.int/md/meetingdoc.asp?lang=en&parent=T22-SG11-230510-TD-GEN-0263).

ITU-T SG11 planned to arrange interim [NSP-WTSA sessions](https://extranet.itu.int/sites/itu-t/studygroups/2022-2024/sg11/SitePages/NSP.aspx). The first session will be held virtual from 18 to 19 December 2023 (S1&2). If more sessions of NSP-WTSA are needed, the dates of the following NSP e-meetings (potentially to be held in March 2024) will be shared via ITU-T SG11 mailing list after the December NSP-WTSA meeting.

ITU-T SG11 will finalize preparation for WTSA at the next ITU-T SG11 meeting (Geneva, 1-10 May 2024, TBA). Details will be shared via the ITU-T SG11 mailing list (t22sg11all@lists.itu.int).

ITU-T SG11 informed TSAG and all SGs of its progress on the preparation for the WTSA-24.

1. **ITU-T SG11 Workshops and Webinars**

ITU continues organizing a series of events related to SG11 activities. Since January 2023, the following events were organized:

* [**ITU Forum**](https://www.itu.int/en/ITU-D/Regional-Presence/CIS/Pages/EVENTS/2023/Tashkent-FN.aspx) **“Future networks”**
Tashkent, Uzbekistan, 23-25 May 2023

The Forum was aimed at discussing trends in Future Networks development, conformance, and interoperability testing, use cases and best practices from different countries.

It was collocated with the ITU-T Study Group 11 Regional Group meeting for Eastern Europe, Central Asia and Transcaucasia (SG11RG-EECAT).

* [**Episode #27**](https://www.itu.int/cities/standards4dt/ep27)**: Digital transformation of testing: federated testbeds as a service**
virtual, 21 June 2023

This webinar answered a key question whether testing activities may migrate to virtual environments and whether testing as a service based on federated testbeds can facilitate enabling quicker time-to-market for products and services. It also examined an up-to-date ecosystem of testbeds, including existing use cases, and clarified how federated testbeds framework defined in Recommendation ITU-T Q.4068 could help with such a challenge.

* [**ITU Tutorial**](https://itu.int/go/TT-TLRP) **on ITU Testing Laboratories recognition procedure**
Geneva, 12 October 2023

The tutorial aimed at guiding all stakeholders on Testing Laboratories recognition procedure established by ITU, its benefits, and all logistical details needed for submitting applications. The [video guideline](https://www.itu.int/webcast/archive/t2022-24sg11), along with the recording and presentations, were made available at the event’s webpage.

* [**ITU Workshop**](https://itu.int/go/WS-CS-02) **on combating counterfeiting and stolen ICT devices. Episode 2**
Geneva, 13 October 2023

The workshop aimed at providing a platform for exchanging views among all stakeholders and international organizations on the potential way forward to stop the spreading and circulation of counterfeit ICT devices in the world, as well as stopping the circulation of stolen mobile devices. It also provided an opportunity to discuss the potential direction for collaboration between the ITU and other international organizations on these subject matters.

1. **ITU-T Focus Group on Testbeds Federations for IMT-2020 and beyond (FG-TBFxG)**

Since its first meeting in April 2022, FG-TBFxG organized six virtual meetings (April, July, November 2022, March, July, November 2023) and made good progress. Currently, FG-TBFxG has collected 12 use cases, and there are 11 ongoing work items, four of which are in the mature stage and are planned to be finalized soon.

During the meeting in July 2023, FG-TBFxG started a new technical report, which will specify the index and relation of the FG-TBFxG Technical Specifications and Technical Reports (D0.2).

Also, ITU organized a webinar, the Episode #27: Digital transformation of testing: federated testbeds as a service, on 21 June 2023.

The next FG-TBFxG meeting is scheduled to be held virtually from 14-16 February 2024.

All interested parties are encouraged to subscribe to the Focus Group mailing list (fgtbf@lists.itu.int) [here](https://www.itu.int/myworkspace#/Mailing) (see instructions [here](https://www.itu.int/en/ITU-T/focusgroups/tbfxg/Documents/Quick_steps-subscribe_to_fgtbf_mailing_list.pdf)).

More details are available on the Focus Group webpage at: <https://itu.int/go/fgtbf>.

1. **SG11 Regional Groups**

There are two Regional Groups in SG11:

* SG11RG-AFR: Study Group 11 Regional Group for Africa;
* SG11RG-EECAT: Study Group 11 Regional Group for Eastern Europe, Central Asia, and Transcaucasia.

**SG11RG-EECAT: Study Group 11 Regional Group for Eastern Europe, Central Asia and Transcaucasia.**

SG11RG-EECAT meeting took place in Tashkent, Uzbekistan from 23 to 25 May 2023. It was collocated with ITU Forum “Future networks” and C&I training, which were held at the same venue. All details are available on the [SG11RG-EECAT](https://www.itu.int/en/ITU-T/regionalgroups/sg11-eecat/Pages/default.aspx) webpage and the report ([SG11RG-EECAT-R1](https://www.itu.int/md/meetingdoc.asp?lang=en&parent=T22-SG11RG.EECAT-R-0001)).

The next meeting of SG11RG-EECAT is planned to be held in 2024; dates and venue are to be confirmed.

**SG11RG-AFR: Study Group 11 Regional Group for Africa**

The meeting of the ITU-T Study Group 11 Regional Group for Africa (SG11RG-AFR) was held virtually from 13-15 September 2023. All details are available on the [SG11RG-AFR](https://www.itu.int/en/itu-t/regionalgroups/sg11-afr/Pages/default.aspx) webpage and in the report ([SG11RG-AFR](https://www.itu.int/md/meetingdoc.asp?lang=en&parent=T22-SG11RG.AFR-R-0001)). It was noted that SG11RG-AFR appointed Mr Kofi Ntim Yeboah-Kordieh (National Communications Authority, Ghana) as SG11RG-AFR Chair. He replaced Mr Isaac BOATENG (National Communications Authority, Ghana) who stepped down due to other commitments. Mr Isaac Boateng was thanked for his leadership and his valuable efforts in the SG11RG-AFR activities.

The next meeting of SG11RG-AFR is planned to be held in 2024; dates and venue are to be confirmed.

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